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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/531,475

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Dirk Inze

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1234

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7590

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EXAMINER

COLLINS, CYNTHIA E

ART UNIT

PAPER NUMBER

1638

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/531,475	INZE ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Cynthia Collins	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-4, 10-16 and 40-50 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 10-16 and 40-50 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

The Amendment filed March 10, 2008 has been entered.

Claims 5-9 and 17-39 are cancelled.

Claims 1, 10, 11, 12, 14 and 16 are currently amended.

Claims 40-50 are new.

Claims 1-4, 10-16 and 40-50 are pending.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

All previous objections and rejections not set forth below have been withdrawn.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 16 and 50 are rejected under 35 U.S.C. 102(b) as being anticipated by Kleinow T. et al. (Functional identification of an Arabidopsis snf4 ortholog by screening for heterologous multicopy suppressors of snf4 deficiency in yeast. Plant J. 2000 Jul;23(1):115-22).

Claims 16 and 50 are drawn to a host cell having one or more altered characteristics when compared to the corresponding wild-type host cell, characterized in that said host cell has modified expression of a nucleic acid which is at least 95% identical to SEQ ID NO:1835 or

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which is at least 95% identical to a sequence encoding SEQ ID NO:1836, and/or modified level and/or activity of a protein encoded by said nucleic acid.

Kleinow T. et al. teach yeast host cells having modified expression of a nucleic acid which is 100% identical to SEQ ID NO:1835 and which is 100% identical to a sequence encoding SEQ ID NO:1836 (page 116 Table 1; see also previously attached sequence alignment between SEQ ID NO:1835 and GenBank Accession No. AF250337). The yeast host cells are altered when compared to the corresponding wild-type host cell at least in that they comprise an expression vector.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 10, 12-15, 40-44 and 46-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kleinow T. et al. (Functional identification of an Arabidopsis snf4 ortholog by screening for heterologous multicopy suppressors of snf4 deficiency in yeast. Plant J. 2000 Jul;23(1):115-22) in view of Sakamoto H. et al. (Expression of a subset of the Arabidopsis Cys(2)/His(2)-type zinc-finger protein gene family under water stress. Gene. 2000 May 2;248(1-2):23-32) and Kim J.C. et al. (A novel cold-inducible zinc finger protein from soybean, SCOF-1, enhances cold tolerance in transgenic plants. Plant J. 2001 Feb;25(3):247-59).

The claims are directed to a method comprising introducing and expressing in a plant a nucleic acid which is at least 95% identical to SEQ ID NO:1835 or which is at least 95% identical to a sequence encoding SEQ ID NO:1836, wherein one or more plant characteristics are altered relative to corresponding wild type plants, and to plants produced by said methods.

Kleinow T. et al. teach yeast host cells having modified expression of a nucleic acid which is 100% identical to SEQ ID NO:1835 and which is 100% identical to a sequence encoding SEQ ID NO:1836 (page 116 Table 1; see also previously attached sequence alignment between SEQ ID NO:1835 and GenBank Accession No. AF250337). Kleinow T. et al. also teaching that expression of a nucleic acid which is 100% identical to SEQ ID NO:1835 and which is 100% identical to a sequence encoding SEQ ID NO:1836 results in the suppression of *snf4* deficiency in yeast.

Kleinow T. et al. do not teach transgenic plants having modified expression of a nucleic acid which is 100% identical to SEQ ID NO:1835 and which is 100% identical to a sequence encoding SEQ ID NO:1836.

Sakamoto H. et al. that expression of the native *Arabidopsis* gene encoding AZF2 (SEQ ID NO:1836) is strongly induced by various stresses including high salt, dehydration and ABA treatment (page 29 Figs. 4 and 5). Sakamoto H. et al. also teach that AZF2 mRNA accumulates in the elongation zone of the roots under the salt-stress condition, suggesting that AZF2 is involved in the water-stress response to regulate downstream genes (page 30 Fig. 6; page 31).

Kim J.C. et al. teach a method comprising introducing and expressing in a plant a SCOF-1 encoding nucleic acid, wherein one or more plant characteristics are altered relative to corresponding wild type plants, including a method wherein said altered plant characteristic is

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enhanced cold stress tolerance (page 250 Figures 4 and 5; page 251 paragraph spanning columns 1 and 2; page 256). The SCOF-1 encoding nucleic acid taught by Kim J.C. et al. is essentially similar to SEQ ID NO:1835 because i) a search of prior art databases indicates that SEQ ID NO:1835 is the same as GenBank Accession No. AF250337, the *Arabidopsis thaliana* zinc finger protein AZF2 (AZF2) mRNA, complete cds (see attached sequence alignment between SEQ ID NO:1835 and GenBank Accession No. AF250337), and because ii) in being a family member of plant two-fingered Cys2/His2-type zinc-finger genes and proteins (Sakamoto H. et al. Expression of a subset of the *Arabidopsis* Cys(2)/His(2)-type zinc-finger protein gene family under water stress. Gene. 2000 May 2;248(1-2):23-32, see page 28 Figure 2), SCOF-1 is a homologue of AZF2. While Kim J.C. et al. are silent with respect to whether nitrogen and/or carbon metabolism are altered, and with respect to whether seed yield is increased, Kim J.C. et al. need not explicitly teach these limitations in order to anticipate the claimed invention, because the alterations of the plant characteristics recited in the claims are a consequence of overexpressing the nucleic acid, and are thus inherent to the method.

Kim J.C. et al. also teach transgenic plants and their parts produced by their method, wherein said transgenic plants comprise and overexpress a SCOF-1 encoding nucleic acid, and wherein said transgenic plants have enhanced cold stress tolerance relative to corresponding wild type plants (page 250 Figures 4 and 5; page 251 paragraph spanning columns 1 and 2; page 256). Kim J.C. et al. additionally teach non-plant host cells modified to express a plant SCOF-1 encoding nucleic acid (page 256 column 1 2d full paragraph; page 257 column 1 1<sup>st</sup> paragraph).

Given the teachings of Kleinow T. et al. that a nucleic acid which is 100% identical to SEQ ID NO:1835 and which is 100% identical to a sequence encoding SEQ ID NO:1836 is

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functional when expressed in yeast, given the teachings of Sakamoto H. et al. that the native *Arabidopsis* gene encoding SEQ ID NO:1836 is strongly induced by various stresses including high salt, dehydration and ABA treatment, accumulates in the elongation zone of the roots under the salt-stress condition, and may be involved in the water-stress response to regulate downstream genes, and given the teachings of Kim J.C. et al. that the expression in plants transformed therewith of a nucleic acid encoding an AZF2 homologue can alter one or more plant characteristics relative to corresponding wild type plants, including stress tolerance, it would have been *prima facie* obvious to one skilled in the art at the time the invention was made to express in plants transformed therewith a nucleic acid which is 100% identical to SEQ ID NO:1835. One skilled in the art would have been motivated to do so in order to determine whether the expression of the gene encoding SEQ ID NO:1836 is involved in stress tolerance. One skilled in the art would have had a reasonable expectation of success given the success of Kleinow T. et al. in expressing in yeast a nucleic acid encoding AZF2 (SEQ ID NO:1836), and given the success of Kim J.C. et al. in expressing in plants a nucleic acid encoding an AZF2 homologue. Accordingly, one skilled in the art would have been motivated to generate the claimed invention with a reasonable expectation of success. Thus, the claimed invention would have been *prima facie* obvious as a whole to one of ordinary skill in the art at the time the invention was made.

Claims 11 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kleinow T. et al. (Functional identification of an *Arabidopsis* snf4 ortholog by screening for heterologous multicopy suppressors of snf4 deficiency in yeast. *Plant J.* 2000 Jul;23(1):115-22)

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in view of Sakamoto H. et al. (Expression of a subset of the *Arabidopsis* Cys(2)/His(2)-type zinc-finger protein gene family under water stress. *Gene*. 2000 May 2;248(1-2):23-32) and Iida A. et al. (A zinc finger protein RHL41 mediates the light acclimatization response in *Arabidopsis*. *Plant J*. 2000 Oct;24(2):191-203).

The claims are drawn to the method according to claim 1 or claim 40 comprising downregulation of expression of a nucleic acid which is at least 95% identical to SEQ ID NO:1835 or which is at least 95% identical to a sequence encoding SEQ ID NO:1836.

Kleinow T. et al. teach yeast host cells having modified expression of a nucleic acid which is 100% identical to SEQ ID NO:1835 and which is 100% identical to a sequence encoding SEQ ID NO:1836 (page 116 Table 1; see also previously attached sequence alignment between SEQ ID NO:1835 and GenBank Accession No. AF250337). Kleinow T. et al. also teaching that expression of a nucleic acid which is 100% identical to SEQ ID NO:1835 and which is 100% identical to a sequence encoding SEQ ID NO:1836 results in the suppression of *snf4* deficiency in yeast.

Kleinow T. et al. do not teach downregulation of expression of a nucleic acid which is at least 95% identical to SEQ ID NO:1835 or which is at least 95% identical to a sequence encoding SEQ ID NO:1836.

Sakamoto H. et al. that expression of the native *Arabidopsis* gene encoding AZF2 (SEQ ID NO:1836) is strongly induced by various stresses including high salt, dehydration and ABA treatment (page 29 Figs. 4 and 5). Sakamoto H. et al. also teach that AZF2 mRNA accumulates in the elongation zone of the roots under the salt-stress condition, suggesting that AZF2 is involved in the water-stress response to regulate downstream genes (page 30 Fig. 6; page 31).



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Iida A. et al. teach a method comprising downregulating the expression in a plant of a RHL41 encoding nucleic acid, wherein one or more plant characteristics are altered relative to corresponding wild type plants, including a method wherein said altered plant characteristic is decreased tolerance to high irradiation (page 196 Figure 5; page 201 column 1 2d full paragraph). The RHL41 encoding nucleic acid taught by Iida A. et al. is essentially similar to SEQ ID NO:1835 because i) a search of prior art databases indicates that SEQ ID NO:1835 is the same as GenBank Accession No. AF250337, the *Arabidopsis thaliana* zinc finger protein AZF2 (AZF2) mRNA, complete cds (see attached sequence alignment between SEQ ID NO:1835 and GenBank Accession No. AF250337), and because ii) in being a family member of plant two-fingered Cys2/His2-type zinc-finger genes and proteins (Iida A. et al. page 193 column 1 1<sup>st</sup> full paragraph; page 195 Figure 2), RHL41 is a homologue of AZF2.

Given the teachings of Kleinow T. et al. that a nucleic acid which is 100% identical to SEQ ID NO:1835 and which is 100% identical to a sequence encoding SEQ ID NO:1836 is functional when expressed in yeast, given the teachings of Sakamoto H. et al. that the native *Arabidopsis* gene encoding SEQ ID NO:1836 is strongly induced by various stresses including high salt, dehydration and ABA treatment, accumulates in the elongation zone of the roots under the salt-stress condition, and may be involved in the water-stress response to regulate downstream genes, and given the teachings of Iida A. et al. that downregulation of the expression of a nucleic acid encoding an AZF2 homologue can alter one or more plant characteristics relative to corresponding wild type plants, including stress tolerance, it would have been *prima facie* obvious to one skilled in the art at the time the invention was made to downregulate the expression of the native *Arabidopsis* gene encoding SEQ ID NO:1836. One skilled in the art

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would have been motivated to do so in order to determine whether the expression of the native *Arabidopsis* gene encoding SEQ ID NO:1836 is involved in stress tolerance. One skilled in the art would have had a reasonable expectation of success, given the success of Iida A. et al. in downregulating the expression of a similar gene. Accordingly, one skilled in the art would have been motivated to generate the claimed invention with a reasonable expectation of success. Thus, the claimed invention would have been *prima facie* obvious as a whole to one of ordinary skill in the art at the time the invention was made.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Remarks***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Collins whose telephone number is (571) 272-0794. The examiner can normally be reached on Monday-Friday 8:45 AM -5:15 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached on (571) 272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cynthia Collins/  
Primary Examiner, Art Unit 1638

CC